

Listing of the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (currently amended) A vibratory rotational rate sensor comprising:

a vibratory element including a pair of vibratory masses disposed symmetrically along a common axis for vibration along the axis;

a driver coupled to only one of the vibratory masses for inducing periodic counter-phase motion in the pair of vibratory masses along the axis;

a first sense circuit coupled to only one of the vibratory masses for sensing motion of the vibratory mass in only one direction orthogonal to the vibratory axis; and

a second sense circuit coupled to the same one of the vibratory masses for sensing motion of the vibratory mass in only another direction orthogonal to the vibratory axis.

2. (cancelled)

3. (original) A vibratory rotational rate sensor as in claim 1 wherein the vibratory masses include magnetic elements and the driver and the sense circuits include electromagnetic elements.

4. (original) A vibratory rotational rate sensor as in claim 1 wherein the driver is coupled to one vibratory mass and the sense circuits are coupled to the other vibratory mass.

5. (previously presented) A vibratory rotational rate sensor as in claim 1 further comprising means for periodically coupling the driver to one vibratory mass and means for coupling the sense circuits to the same vibratory mass during times when the driver is not coupled.

6. (original) A vibratory rotational rate sensor as in claim 1 wherein the one and the other directions are coplanar and generally orthogonal to one another.
7. (original) A vibratory rotational rate sensor as in claim 1 including a motion sensor for sensing the amplitude and phase of the motion of the vibratory masses along the vibratory axis, wherein the motion sensor is coupled to the driver, and the driver drives the vibratory masses in a repeatable manner in response to the sensed amplitude and phase.
8. (original) A vibratory rotational rate sensor as in claim 1 further comprising a planar restoring element having resilient first members coupled to one of the masses and resilient second members coupled to the other of the masses.
9. (original) A vibratory rotational rate sensor as in claim 8 further comprising a single homogeneous restoring element having resilient first members coupled to each of the masses.
10. (original) A vibratory rotational rate sensor as in claim 8 wherein the resilient first and second members are elongated such that they have a length greater than the straight-line distance between their ends.
11. (original) A vibratory rotational rate sensor as in claim 8 wherein the restoring element further includes resilient mounting members for connecting the vibratory assembly to an external mount.
12. (previously presented) A vibratory rotational rate sensor as in claim 1 wherein a resonance of the counter-phase motion and a resonance of the sensed motion are sufficiently close to magnify the sensed motion.

13. (original) A vibratory rotational rate sensor as in claim 8 wherein the planar restoring element is radially X-fold symmetric, X being an integer 3 or greater.

14. (currently amended) A method for operating a vibratory rotational rate sensor, the rate sensor including a pair of vibratory masses disposed symmetrically along a common axis for vibration along the axis, the method comprising the steps of:

driving only one of the vibratory masses for inducing periodic counter-phase motion in the pair of vibratory masses along the axis;

sensing motion of only one of the vibratory masses in only a first direction orthogonal to the vibratory axis; and

sensing motion of the same one of the vibratory masses in a second direction orthogonal to the vibratory axis.

15. (cancelled)

16. (original) A method for operating a vibratory rotational rate sensor as in claim 14 wherein the vibratory masses include magnetic elements and the steps of sensing are done electromagnetically.

17. (previously presented) A method for operating a vibratory rotational rate sensor as in claim 14 wherein the driver is only coupled to one vibratory mass and the sense circuits are coupled to the other vibratory mass, wherein the step of driving drives only one of the vibratory masses and the steps of sensing sense the motion of the other vibratory mass.

18. (previously presented) A method for operating a vibratory rotational rate sensor as in claim 14 wherein the step of driving drives only one vibratory mass intermittently and the steps of sensing sense the motion of the one vibratory mass during times when it is not being driven.

19. (original) A method for operating a vibratory rotational rate sensor as in claim 14 wherein the one and the other directions are coplanar and generally orthogonal to one another.

20. (original) A method for operating a vibratory rotational rate sensor as in claim 14 further including the step of sensing the amplitude and phase of the motion of at least one of vibratory masses along the vibratory axis, and the step of driving drives the vibratory masses in a repeatable manner in response to the sensed amplitude and phase.